

What is claimed is:

1 1. An apparatus for use in an optical network for providing specified
2 communications signals to targeted recipients, said apparatus comprising:

3 one or more cross-connect devices for receiving communication signals on
4 individual communication paths; and

5 one or more optical multiplexer units having inputs respectively coupled to
6 outputs of said cross-connect devices,

7 wherein said cross-connect devices are operable to selectively distribute said
8 communication signals on said individual communications paths to none, some or all
9 inputs of said optical multiplexer units for distribution to said targeted recipients.

1 2. The apparatus of Claim 1, wherein said apparatus is placed within a
2 ~~passive optical network.~~

1 3. The apparatus of Claim 1, wherein said specified communication signals
2 are contained on various optical wavelengths, one or more selected wavelengths being
3 representative of a target service for said target recipients.

1 4. The apparatus of Claim 1, wherein said optical network is a CATV
2 network.

1 5. The apparatus of Claim 1, wherein said network is dynamically
2 reconfigurable depending on changing customer needs.

1 6. The apparatus of Claim 1, further including a controller coupled to cross-
2 connect devices and said optical multiplexers, said controller being operable to track
3 connections and signal distribution of said cross-connect devices and said optical
4 multiplexer units to thereby determine usage of said specified communications signal by
5 said targeted recipients.

1 7. The apparatus of Claim 1, wherein said cross-connects include M inputs
2 and said optical multiplexers include N outputs, said connections between said cross-
3 connect devices and said optical multiplexer units being divided into M/N groups.

1 8. The apparatus of Claim 1, further including a power splitter for splitting
2 an incoming optical signal into a given number of outputs.

1 9. The apparatus of Claim 8, wherein said optical network is a WDM
2 network, further including one or more optical demultiplexing units respectively coupled
3 between said power splitter and said cross-connect devices.

1 10. The apparatus of Claim 1, wherein multiple ones of said apparatus are
2 hierarchically distributed within said network.

1 11. The apparatus of Claim 1, wherein said cross-connect devices are MEMs
2 devices.

1 12. The apparatus of Claim 1, wherein an additional one of said apparatus is
2 utilized to direct upstream communications in said network.

1 13. In a CATV distribution network, at least a portion of which includes
2 optical distribution capabilities, an apparatus for providing selective distribution of
3 specified signals to miniature fiber nodes in said network, said apparatus comprising:

4 one or more cross-connect devices for receiving said specified communication
5 signals on individual communication paths; and

6 one or more optical multiplexer units having inputs respectively coupled to
7 outputs of said cross-connect devices,

8 wherein said cross-connect devices are operable to selectively distribute said
9 communication signals to inputs of said optical multiplexer units for targeted distribution
10 to said miniature fiber nodes.

1 14. The apparatus of Claim 13, wherein said specified communication signals
2 are contained on various optical wavelengths, one or more selected wavelengths being
3 representative of a target service for said target recipients.

1 15. The apparatus of Claim 13, wherein said network is dynamically
2 reconfigurable depending on changing customer needs.

1 16. The apparatus of Claim 13, further including a controller coupled to cross-
 2 connect devices and said optical multiplexers, said controller being operable to track
 3 connections and signal distribution of said cross-connect devices and said optical
 4 multiplexer units to thereby determine usage of said specified communications signal by
 5 targeted recipients coupled to said miniature fiber node.

1 17. The apparatus of Claim 13, wherein said cross-connects include M inputs
 2 and said optical multiplexers include N outputs, said connections between said cross-
 3 connect devices and said optical multiplexer units being divided into M/N groups.

1 18. The apparatus of Claim 13, further including a power splitter for splitting
 2 an incoming optical signal into a given number of outputs.

1 19. The apparatus of Claim 18, wherein said optical network is a WDM
 2 network, further including one or more optical demultiplexing units respectively coupled
 3 between said power splitter and said cross-connect devices.

1 20. The apparatus of Claim 13, wherein multiple ones of said apparatus are
 2 hierarchically distributed within said network.

1 21. In a CATV distribution network, at least a portion of which includes
 2 optical distribution capabilities, a method for providing selective distribution of specified
 3 signals to miniature fiber nodes in said network, said comprising the steps of:

4 receiving said specified communication signals on individual communication
 5 paths at on or more cross-connect devices;

6 respectively coupling inputs of one or more optical multiplexer units to outputs of
 7 said cross-connect devices,

8 controlling said cross-connect devices to selectively distribute said
 9 communication signals to inputs of said optical multiplexing units for targeted
 10 ~~distribution to said miniature fiber nodes.~~

1 22. The method of Claim 21, wherein said specified communication signals
2 are contained on various optical wavelengths, one or more selected wavelengths being
3 representative of a target service for said target recipients.

1 23. The method of Claim 21 wherein a controller couples to cross-connect devices
2 and said optical multiplexers, said controller being operable to track connections and
3 signal distribution of said cross-connect devices and said optical multiplexer units to
4 thereby determine usage of said specified communications signal by targeted recipients
5 coupled to said miniature fiber node.

1 24. The method of Claim 21, further including the step of power splitting an
2 incoming optical signal into a given number of outputs prior to being input to said cross-
3 connect devices.

1 25. The method of Claim 24, wherein said optical network is a WDM
2 network, further including the step of demultiplexing the power split signals prior to
3 being input to said cross-connect devices.